How Is the Market Size Relevant as a Determinant of FDI in Developing Countries? A Research on Population and the Cohort Size

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Abstract : The small size of the market in developing countries is associated with non-market seeking FDI activities. Even though, GDP per capita is a poor indicator for the market seeking FDI activities in developing countries, both population and GDP are crucial. The findings of the study suggest that FDI is concerned with the size of market in developing countries not in per capita basis but rather in aggregate size. More precisely, FDI will more likely focus on regional areas rather than on an expansion through the country. In terms of cohort size, the size of middle age cohort promotes FDI, and old and young age cohorts weaken FDI.

Keywords: Developing Countries; FDI; domestic market size; population; cohort size.

Introduction

How do multinational enterprises decide on the locations of their foreign direct investment (FDI)[1]? Market size has been the single most widely accepted as a significant determinant of FDI flows (Chakrabarti, 2001). The larger the host area's (country, region, and sub region) total income and its potential for development, the greater the amount of the FDI investment (Billington, 1999). A large market is necessary for efficient utilization of resources and exploitation of economies of scale (Chakrabarti, 2001). On the other hand, Asiedu (2002) argues that market size is not a determinant for a developing country due to low income. In the FDI literature, not much research on the impact of the market size has been conducted yet for developing countries. The additional originality of this paper is to approach the market size framework from the population aspect and its cohort size. In this respect, this research is intended not just to review previous models dealing with the market size, but also to examine the significance of untested market size determinants of locations.

The market size itself cannot be easily ascertained (Billington, 1999). Regressions of Schimitz and Bieri (1972) are estimated for U.S.A. FDI to Canada, the EEC and EFTA. Their market size proxy is GNP and growth of GDP[2].

Root and Ahmed (1979) identify unattractive, moderately attractive and highly attractive countries in terms of FDI per capita for 58 countries with 38 variables. The unattractive category represents FDI per capita as less than $1, the moderately attractive as between $1 and $4.1, and the attractive as more than $4.1. They use GDP, GDP per capita and growth per capita as a proxy for market size. They argue that the absolute size of GDP is more likely to reflect population size rather than per capita income. Their conclusion is that developing countries that have attracted FDI have a relatively advanced infrastructure, comparatively high growth rates and per capita GDP, and political stability.

Culem (1988) tests the impact of market size for 14 countries for the period of 1969-1982. A bigger market allows the benefits of large-scale production to be more readily captured. Moreover, investors naturally prefer faster growing markets, which offer more promising prospects.

Billington[3] (1999) is the first author to consider population as a variable; she uses population density as a determinant of FDI. Population density implies a more concentrated consumer and labor market as well as a more integrated infrastructure (Billington, 1999).

Chakrabarti (2001) states that absolute GDP is a poor indicator since it reflects the size of the population rather than the income per capita. Broadly, this paper aims to explore the impact of market size on FDI considering population size and its characteristics in developing countries in a theoretical and empirical framework.

[1] Some major benefits of FDI are that FDI is a much better way than borrowing due to risk factor of repayment, and reforms for an increase of FDI may directly also promote growth (Gastanaga et al. ,1998).
[2] Lunn (1980)'s findings support Scmitz and Bieri (1972) except the first lag growth, which is negatively correlated with FDI.
[3] Billington (1999) uses GDP and growth rate of GDP.

This paper is structured in the following ways: In section 2, we define methodology and all the variables of interest. Section 3 provides an analysis of results. Finally, section 5 concludes by considering the implications of these findings.

2. Methodology

We use average data from 1980 to 2000, and we apply cross-sectional OLS. The standard error is White Heteroskedasticity Consistent . FDI is a dependent variable. The list of data and countries is obtained from the World Bank (2003) and is reported in the appendix.

$$FDI = \alpha + \beta \text{ (Population Variables)} + \prod \text{ (Control Variables)} + u_i \quad (11)$$

Where α is a constant coefficient, β and $\prod$ are the estimated coefficients on the independent variables and u_i is an error term.

The impact of population variables according to the model that we presented in section 2 is measured in several ways; size of population (n), life expectation (m) and young, middle and older population-cohort size (c). Further more, population growth rate can be also considered in the same framework. Higher population growth rates will more likely attract FDI.

2.1. Dependent Variable

Billington (1999) considers total FDI, Culem (1988) uses the share of FDI in GNP, Chakrabarti (2001) prefers FDI per capita, and Asiedu (2002) uses the share of FDI in GDP. In this research, we consider FDI (% GDP) as a standard in the literature (Asiedu, 2002). Plus, Chakrabarti (2001) indicates that GNP refers to citizens who do not live in the country. So, they are not the part of the domestic market.

2.2. Independent Variables

2.2.1. Infrastructure

Infrastructure increases the productivity of investments. The proxy for infrastructure varies. Billinton (1999) uses government expenditure on transportation and communications, and Asiedu (2002) chooses telephone mainlines (per 1000) as a proxy for infrastructure. In this research, we will use telephone mainlines (per 1000) as in standard in the literature (Asiedu, 2002)

2.2.2. Import

A high level of imports into the host area may indicate a high level of penetration by foreign companies who may begin exporting to the host countries and switch later to FDI (Culem, 1988).

2.2.3.Manufacturing

Industrialization will tend to encourage capital-intensive companies, so it should also attract FDI. The share of manufacturing in GDP represents the degree of industrialization (Wheeler and Mody, 1992).

2.2.4. Human Capital

Multinational are distinguished from national firms in terms of four characteristics: high level of R&D, professional and technical workers, new and complex products and advertising (Markusen, 1995). From this perspective, we believe that human capital as well as physical infrastructure in a country is relevant to draw FDI to the country.

The theoretical relationship between human capital and FDI is demonstrated by Zhang and Markusen (1995). Multinational firms are able to exploit factor-price differences in the world economy, locating skilled-labor intensive phases of operation in skilled-labor abundant locations and unskilled-labor-intensive in respective locations. (Zhang and Markusen, 1995). This correlation is tested the macro level by Akin and Vlad, (2004). The authors show that FDI flows to skilled-labor abundant countries.

In this research, primary education enrollment is considered as a proxy for human capital (Barro, 1991).

2.2.6. Income

We include income, since concepts such as total GDP, GDP per capita and growth are considered as proxies of the abundance of the market size. We are able to compare the population argument with the standard proxies (see more discussion in the introduction and the theoretical framework).

3. Empirical Results

Table 2 reports the results of the regression of Model 1 and 2, which compare population size and GDP. The results show that the population size is more relevant than GDP to measure the effects of domestic market. A more populated nation can have a more promising future for investors. However, a similar comparison is realized in model 4 and 5. In this case, both of the variables are positive and significant. This result suggests that GDP is a good proxy to measure the market size. However, in some cases GDP is not sufficient to take into account the population size. For instance, a country, which may currently have a low GDP, may have a high GDP in the future, thanks to growth of income and population. In this context, population reflects promising prospects.

Table 2: FDI (%) is dependent variable: average 1980-2000

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	-.52 (-.36)	-.54 (-.37)	-.23 (-.16)	-.63 (-.46)	-.63 (-.45)
Telephone Mainlines	-.0047 (-1.42)	-.0047 (-1.42)	-.005 (-1.52)	-.000457 (-0.09)	-.000253 (-0.052)
Import (%)	.05 (4.9)***	.05 (4.7)***	0.05 (4.73)***	0.04 (5.03)***	0.04 (4.96)***
GDP Per Capita (PPP)	-0.00000391 (-.03)	-0.00000155 (-.134)	-0.0000009 (0.08)	- 8.08 (E-08) (-.61)	-.0000971 (-.73)
GDP Growth (%)	-0.052 (-.95)	-0.049 (-.88)	-.05 (-1.09)	-.05 (-1.27)	-.06 (-1.29)
Pop Growth (%)	-.37 (-2.48)**	-.37 (-2.43)**	-.44 (-2.89)***	-.51 (2.8)***	-.51 (2.8)***
Pop Density	-0.002 (-2.21)**	-0.002 (-2.129)**	-.0024 (-2.29)**	-.0027 (-2.3)**	-.0026 (-2.2)**
Pop Total	11(E-10) (1.68)*			1.52 (E-09) (1.72)*	
Life Expectancy	0.026 (1.001)	0.026 (1.001)	0.024 (.92)	0.01 (.6)	0.01 (.6)
GDP (PPP)		45 (E-14) (1.01)			9.52(E-13) (1.75)*
0-14 Age Pop			-2.04 (E-08) (-1.27)		
14-65 Age Pop			3.29(E-08) (1.81)*		
65 Over Pop			-2.52 (E-07) (-1.88)*		
Primary Education (%)				.023 (2.92)***	.022 (2.88)***
Manufacturing Value Added				-.064 (-1.57)	-.064 (-1.59)
N	110	110	110	105	105
R-square	.32	.32	.33	.38	.38

White Heteroskedasticity-Consistent Standard Errors
* **t is statistically significant at 1% level
** t is statistically significant at 5 level
*t is statistically significant at 10 % level

Asiedu (2002) argues that FDI flows with non-market seeking activities in developing countries. Even though GDP per capita and GDP growth are negatively correlated (not significant) in all models, GDP or population size is positively correlated with FDI and significant. This may indicate that FDI is taken into account the size of market in developing countries not in per capita basis but rather in aggregate size. More precisely, FDI will more likely focus on regional areas with relatively higher purchasing power rather than on an expansion throughout the country.

Model 3 includes the population by cohort size: young (0-14 age), middle (14-65) and old (65 and above) ages. Our regression suggests that the middle age[1] cohort is positively and significantly correlated with FDI. However, the older cohort size is negatively and significantly correlated with FDI. This suggests that a society where the age demography consists heavily of old people will receive less FDI because old people have a shorter life span and are more likely to be maturated in consumption[2]. The coefficient of young cohort size is negative and not significant. Contrarily, a young cohort size can be very eager to purchase all goods. On the other hand, they may not earn income or receive sufficient allowances from their parents to fulfill their aspirations.

Model 4 and 5 indicate that human capital acquisition is important to attract more FDI (Akin and Vlad, 2004, Walkirch 2003). However, telephone mainlines as a proxy of infrastructure and manufacturing as a proxy of industrialization are negatively correlated but insignificant. Further more, high population growth and population density are not promoting FDI. However, Billington (1999) suggests that the concentration of the human resources in one region is more attractive for FDI. This result suggests the importance of the balanced in population density.

None of the regression results finds an enhancement of FDI due to life expectation.

4. Conclusion

We have presented a model in which population and its characteristics have a systematic effect on FDI in developing countries. The small size of the market due to the low income argument in developing countries is associated with non-market seeking FDI activities. Even though GDP per capita is a poor indicator for the market seeking FDI activities in developing countries, both population and GDP are crucial. This result suggests that FDI is taken into account the size of market in developing countries not in per capita basis but rather in aggregate size. More precisely, FDI will more likely focus on regional areas with relatively higher purchasing power rather than an expansion through the country.

We also hypothesize that higher life expectation and young cohort size will attract more FDI. The result shows that life expectation has a slight impact on FDI. An overwhelmingly young or old cohort size impedes FDI; however a moderate age composition attracts FDI.

Human capital acquisition promotes FDI. The weak association between the level of manufacturing and FDI suggests that FDI in developing countries barely flows to industrial sectors.

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[1] Our theoretical model favors the young cohort size rather than the middle age cohort.

[2] A similar argument can be made in terms of traditional and modern consumption patterns, since relatively young people can be more eager of new items.

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